

than a request for clarification. However, our article showed that alternative models for generating evidence should not be restricted to quasi-experimental or “rigorous” evaluation designs, as Yeh and Brandes propose. Such designs attempt to reproduce, rather than critically assess, the experimental model upon which the randomized controlled trial is based.<sup>4</sup> Ensuring improved population health depends on diverse phases of programmatic activity, including the development of interventions, evaluation, monitoring, and in-depth problem solving. Research inputs for each of these phases emerge from distinct epistemological approaches.<sup>5,6</sup> For example, developing new interventions requires not “rigorous” evaluation, but “formative research,” composed usually of observational epidemiology, sociology, and anthropology. If one accepts these epistemological distinctions, it would be incorrect to conclude, as Yeh and Brandes do, that the “experimental approach represents a standard to attain.” At certain moments in the public health process, recourse to the experimental approach would be an erroneous choice altogether. ■

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### Contributors

D.P. Behague wrote the letter, and K.T. Storeng reviewed and commented on the letter.

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### HIGH VITAMIN D AND CALCIUM REQUIREMENTS DURING PREGNANCY AND TOOTH LOSS

Russell et al.<sup>1</sup> reported that tooth loss increased with increasing parity. Socioeconomic position, frequency of dental care visits, smoking, diabetes, age at most recent live birth, and length of time since most recent live birth were significant predictors of tooth loss. Nonetheless, the mechanisms of the association were found to remain undefined.

A factor not considered, but which is likely to explain the association, is vitamin D. In the Third National Health and Nutrition Examination Survey, serum 25-hydroxyvitamin D (calcidiol) concentrations were significantly and inversely associated with attachment loss among men and women 50 years or older.<sup>2</sup> Periodontal disease is caused by bacteria, which create a biofilm on the teeth and leach calcium from the teeth and bones because of acidity, leading to tooth loss.<sup>3</sup>

With the link to bacterial infection, the role of the innate immune system in reducing the risk of such infections should be considered. A current topic of research regarding the human innate immune system concerns the role of human cathelicidin, LL-37, in fighting bacterial and viral infections. LL-37 production is induced by 1,25-dihydroxyvitamin D (calcitriol).<sup>4</sup> It has been found to have strong antimicrobial<sup>5,6</sup> and antiendotoxin effects.<sup>6</sup>

Adequate vitamin D and calcium are very important for a healthy pregnancy and delivery. Unfortunately, the currently recommended vitamin D intake during pregnancy in the United States, 200 to 600 IU/d,<sup>7</sup> is woefully inadequate. Current research has shown that the actual dietary requirement during pregnancy and lactation may actually be as high as 6000 IU/d.<sup>8</sup> Indeed, a high prevalence of vitamin D insufficiency has been found among both Black and White

pregnant women residing in the northern United States.<sup>9</sup>

Thus, the likely effect of pregnancy and lactation on vitamin D and calcium is to deplete both unless adequate amounts are obtained. The fact that race was one of the most important factors explaining tooth loss<sup>1</sup> is consistent with the general finding that Black women have lower vitamin D levels than do White women, because of a combination of darker skin, lower dietary sources of vitamin D, and lower use of supplements. Both adequate vitamin D and calcium are recommended for reduced risk of tooth loss arising from periodontitis.<sup>10</sup> ■

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